

**INFORMATICS PROGRAM****INF 560: Data Informatics Professional Practicum (3 units)**

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Spring 2016 Syllabus  
Time: Friday at 3pm to 5:50pm  
Location: KAP163

**Professor's Office Hours:**

Friday 1:30 p.m. to 3:00 p.m.  
Office: GER 207

Students are advised to make appointments with the professor ahead of time in any event and be specific with the subject matter to be discussed. Students should also be prepared for their appointment by bringing all applicable materials and information.

**Catalogue Description:**

Student teams working on external customer data analytic challenges; project/presentation based; real client data, and implementable solutions for delivery to actual stakeholders; capstone to degree.

**Expanded Course Description:**

One of the fundamental principles of informatics science is the ability to live in the data. It is necessary to gain a level of immersion in the information environment to truly apply the diverse skill sets necessary to both become an effective analyst, and provide customers solutions to hard problems. While students will get a sense of this paradigm in many of the courses focused on knowledge and skill enhancement throughout their degree matriculation, the goal of this course is to combine previously learned capabilities and apply them against actual data sets, in real data environment, and toward solving difficult challenges for an external stakeholder.

The Data Informatics Professional Practicum is a capstone experience designed to allow students exposure to the world of data analytics from the perspective of the organization. Students will work with external stakeholders on a project that answers an organizational problem. Each semester, the Informatics program will partner with an external organization, which will pose a broad business requirement to the class. Students will team and propose projects around this requirement, and be responsible for delivering an informatics-based solution to the stakeholder. This product will consist of a not less than 50 page report detailing the proposal, methods utilized in the analysis, the output from the analysis, and conclusions and recommendations based on the study. Students will also be responsible for a not less than 30-minute presentation on their project to the stakeholder.

A possible example of a capstone project would be: Google volunteers to be the external partner. They obviously are one of the main collectors and brokers of information in the world. One of their areas of philanthropic interest is disease monitoring. Google might pose the question “How can the data Google collects in general could be better utilized to inform on disease, or help mitigate disease, in various areas in the world?” It would be up to the student teams to proposal a project plan, design a study, implement the analysis, and report conclusions and recommendations.

### **Learning Objectives**

- Expected learning outcomes for students are:
- To understand how to apply the various engineering and business principles studied in Data Informatics curriculum toward solving an organizational challenge
- To handle difficulties associated with defining and organizing a realistic problem Statement
- To manage impediments in obtaining information and approval
- To present and sell ideas to higher-level management
- To understand the importance of the need for a continuous exchange between engineers, management and employees in solving an existing problem, given a set of constraints
- To meet aggressive deadlines in a multidisciplinary team effort
- To improve project-based presentation skills, both in-class and in company settings
- To understand the requirements and objectives of customers, how these vary, and how one must tailor a solution to the expectations of a customer
- To understand how informatics are viewed in diverse domains; and how solutions and approaches will differ in various fields
- To understand how to work with individuals from diverse domain (engineering, business, etc.) to accomplish a common goal

Students are expected to have foundational knowledge in data management, machine learning, data mining, and data visualization, as well as other topics associated with the Data Informatics degree program. The course can be taken by students in the ISE Analytics program and/or the Marshall Business Analytics program (being created) as well as the Data Informatics program. Course is usually taken after other courses in the program. This class will be primarily group work, with some assigned readings, and a major project and presentation that will count for the primary grade in the course.

### **Assignments/Reports/Project**

The major deliverable from this course is a written project report that reflects a proposed solution, and subsequent results, for an external stakeholder. At the first class meeting, the external partner will be introduced, and a problem/requirement posed. Students will then divide into teams. All projects are team projects. All topics will be unique, and there should be high levels of collaboration on the projects with team members and the professor. Students are required to meet with the professor not less than three times during the semester. Students are required to submit three progress reports throughout the course. There will be a midterm.

There will be three inputs to students' final grades: 1) instructor evaluation; 2) peer review; and 3) evaluation by external stakeholder.

NO PROJECTS WILL BE ACCEPTED LATE, AND STUDENTS MUST PRESENT THEIR FINDINGS ON THE DAY SELECTED DURING THE SEMESTER.

### **Class Communication:**

Blackboard at USC will be used for class communication.

### **Grading Schema:**

Course Project Report (Includes peer reviews):	40%
Sponsor Review of Report, Presentation, and Findings:	20%
Course Project Presentation:	15%
Midterm:	15%
Participation, Progress Reports, and Instructor Meetings:	10%
<b>Total</b>	<b>100%</b>

Grades will range from A through F. The following is the breakdown for grading:

94 - 100 = A	74 - 76 = C
90 - 93 = A-	70 - 73 = C-
87 - 89 = B+	67 - 69 = D+
84 - 86 = B	64 - 66 = D
80 - 83 = B-	60 - 63 = D-
77 - 79 = C+	Below 60 is an F

**Class Structure & Schedule:**

Class sequence, dates, topics and guest speakers are subject to change as the semester proceeds. Any revisions will be noted and announced in class in advance.

<b>Week</b>	<b>Topic</b>	<b>Readings/Notes</b>	<b>Homework</b>
<b>Week 1</b> <b>Jan 15</b>	Orientation, Requirement Outline, Developing Project Ideas, Fundamentals of Project Management	Overview of project management in Data informatics Post-class, teams will be formed	Ref: Fundamentals of Project Management (Worksmart) : Joseph Heagney
<b>Week 2</b> <b>Jan 22</b>	External Partner presentation, Lean Thinking, Deliverables, DMAIC <sup>1</sup> , Analytics in the “real world”	The external sponsor will present and challenge the class Knoepfel Chapters 1-5 Proposals briefs (1-3 pages outlining “big idea”) will be completed	Team Formation, Project Selection, Proposal Briefs
<b>Week 3</b> <b>Jan 29</b>	Value stream mapping , Quality, Variability, and Role of the Analyst	Project Initiation; Prepare Monthly Report Proposal Brief Review – schedule time with instructor	Proposal Briefs Due Monday Sep 14 at 5:00pm.
<b>Week 4</b> <b>Feb 5</b>	Root Cause Analysis, Teams, People, Lean Engineering	Schedule Time to Meet with Instructor	NA
<b>Week 5</b> <b>Feb 12</b>	Understanding the Analytics Product in Business, Improve	Guest Lecturer on the topics of business analytics, and the expectation of the data analyst in the commercial space You must meet with your instructor this week to review monthly report	First Monthly Report Due
<b>Week 6</b> <b>Feb 19</b>	Total project management and Theory of Constraints	Project Work Time	NA
<b>Week 7</b> <b>Feb 26</b>	Mid-Term Review	Half of class dedicated to mid-term review Remainder of class dedicated to project work	Mid-term review packet

<sup>1</sup> DMAIC refers to a data-driven quality strategy for improving processes, and is an integral part of the company's Six Sigma Quality Initiative. DMAIC is an acronym for five interconnected phases: Define, Measure, Analyze, Improve, and Control.

<b>Week 8 March 4</b>	Mid-Term, Project Work Time	Mid-Term Schedule meeting with instructor	Second Monthly Report Due
<b>Week 9 March 11</b>	Stakeholder Session	Stakeholder will be in class to review progress, answer questions, provide presentation to class. You must have had your second instructor review meeting by the end of this week	Instructor Meeting
<b>Week 10 March 18</b>	<b>Spring Recess</b>	<b>No Class</b>	
<b>Week 11 March 25</b>		Management, Leadership and entrepreneurship. Correction and discussion of Midterm exam.	
<b>Week 11 Apr 1</b>	Understanding the Analytics Product in industry	Guest Lecture on the topics of analytics and “Big Data”. Review expectations of the analyst in the Retail Industry and marketing. Schedule time to meet with instructor	Third Monthly Report Due
<b>Week 12 Apr 8</b>	Understanding the “Pitch”, selling ideas to clients, Reporting to Stakeholders Dress Rehearsal	Guest Lecture For those who desire, they will be able to go over their reports and presentations with the instructor, and receive feedback before presenting to the customer Schedule time to meet with instructor	Third Monthly Report Due
<b>Week 14 Apr 15</b>	Dress Rehearsal	For those who desire, they will be able to go over their reports and presentations with the instructor, and receive feedback before presenting to the customer	
<b>Week 15 Apr 22</b>	Projects Due, Presentations	Presentations will conclude All projects must be submitted on Tuesday of the next week by 5:00 p.m.	Presentations Continue Project Due
<b>Week 16 Apr 29</b>	Stakeholder Summit	Stakeholder will be in class Student presentations	

**Books and Readings:**

All books, papers or reports will be available to students in one of three ways: 1) in the USC bookstore; 2) via a CD that the instructor will provide at the beginning of class; and/or 3) via the web.

J. Heagney "Fundamentals of Project Management (Worksmart)" Fourth Edition Edition, 2011.

C. E. Knoeppel, "Installing Efficiency Methods," The Engineering Magazine Company, republished by Google Books, 1917.

***Assigned Reading and Media List:***

A. Farzindar and D. Inkpen "Natural language processing for social media", Morgan & Claypool Publishers, 2015.

McKinsey Global Institute, "The challenge – and opportunity – of 'big data,'" in McKinsey Quarterly, May 2011.

Richard T. Kouzes, Gordon A. Anderson, Stephen T. Elbert, Ian Gorton, and Deborah K. Gracio, "The Changing Paradigm of Data-Intensive Computing," in IEEE Computer, January 2009.

David Bollier, "The Promise and Peril of Big Data," through The Aspen Institute Communications and Society Program, 2010.

James Manyika, Michael Chui, Brad Brown, Jacques Bughin, Richard Dobbs, Charles Roxburgh, Angela Hung Byers, "Big data: The next frontier for innovation, competition, and productivity," published through McKinsey Global Institute, May 2011.

Viktor Mayer-Schonberger, Kenneth Cukier, "Big Data: A revolution that will transform how we live, work and think," Emaon Dolan/Houghton Mifflin Harcourt, March 2013.

Eric Siegel, "Predictive Analytics: The power to predict who will click, buy, lie, or die," Wiley, February 2013.

Lev Manovich, "Trending: the Promise and the Challenges of Big Social Data," Debates in the Digital Humanities, July 2011.